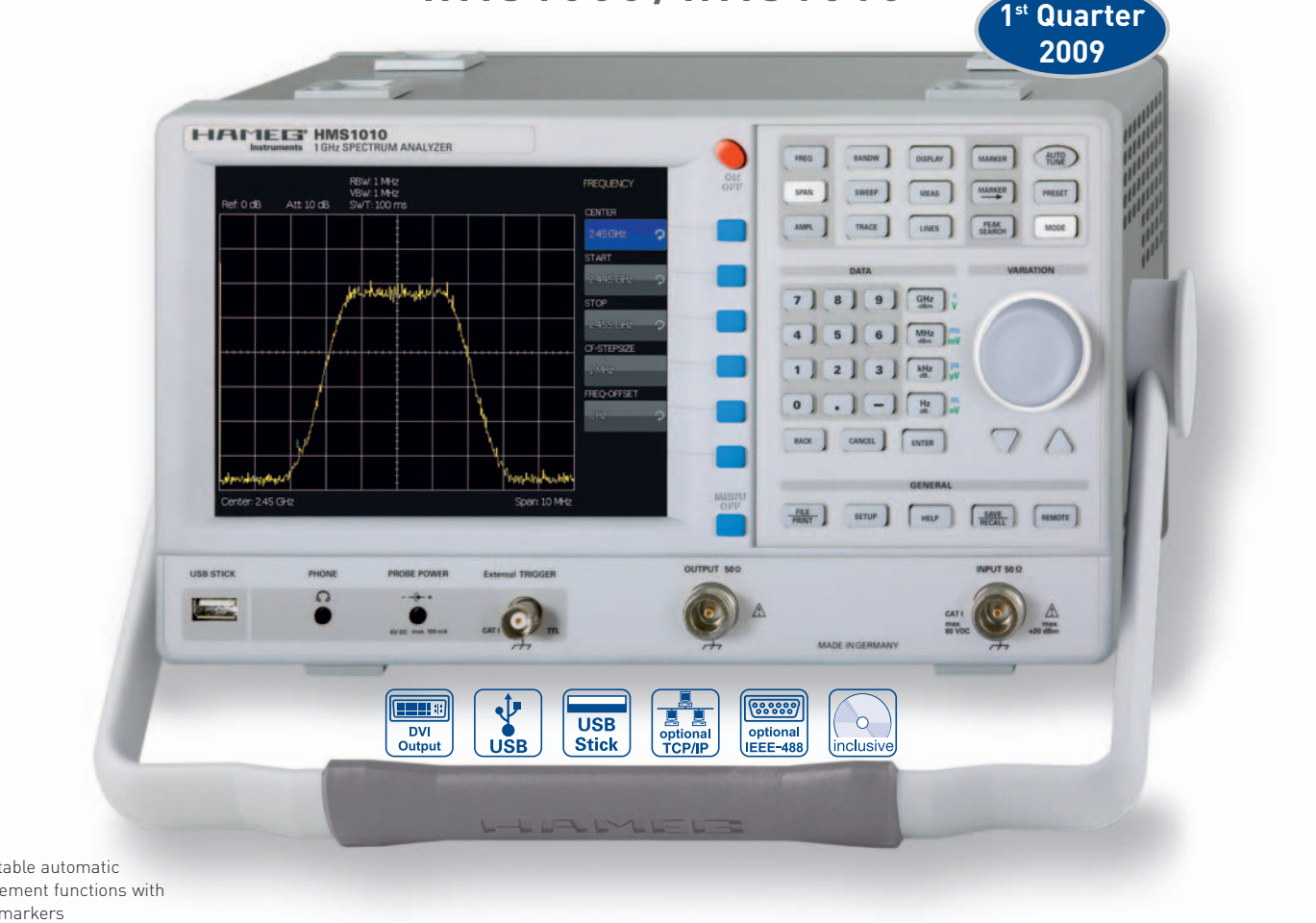
HAMEG Instruments

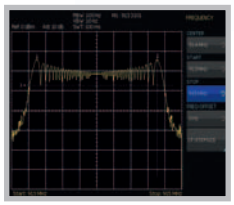
1GHz Spectrum Analyzer
HMS1000/HMS1010

HMS1010

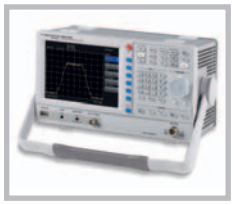
1st Quarter 2009



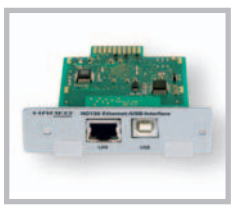
Comfortable automatic measurement functions with up to 8 markers



1GHZ Spectrum Analyzer HMS1000 without TG



Ethernet/USB-interface HO730 for industrial use (Option)



- ☑ Frequency range 100kHz...1GHz
- ☑ Amplitude measurement range -114dBm...+20dBm
- ☑ Sweep time 20ms...1000s
- ☑ Resolution bandwidth (RBW) 1kHz...1MHz in 1-3 Steps, 200kHz (-3dB) additional 9kHz, 120kHz, 1MHz (-6dB)
- ☑ Spectral purity ‹-100dBc/Hz (@100kHz)
- ☑ Video bandwidth (VBW) 10Hz...1MHz in 1-3 steps
- ☑ Tracking Generator (HMS1010) -20dBm...0bBm in 1dB steps
- ☑ Integrated AM and FM demodulator (headset output)
- ☑ Detectors: Auto-, min-, max-peak, sample, RMS, quasi-peak
- ☑ 8 Marker with delta marker, miscellaneous peak functions
- ☑ Silent operation (no fan)
- ☑ 6.5" TFT color VGA display, DVI output
- ☑ 3 x USB for mass-storage, printer and remote control optional IEEE-488 (GPIB) or Ethernet/USB Interface

1GHz Spectrum Analyzer HMS1000, HMS1010 (with TG)
3GHz Spectrum Analyzer HMS3000, HMS3010 (with TG)

All data valid at 23 °C after 30 minute warm-up

Frequency

Frequency range:	
HMS1000, HMS1010	100kHz...1GHz
HMS3000, HMS3010	100kHz...3GHz
Temperature stability:	± 2ppm (0...30°C)
Aging:	± 1ppm/year
Frequency counter:	
Resolution	1Hz
Accuracy	± (Frequency x failure of reference)
Span setting range:	
HMS1000, HMS1010	0Hz (zero span) and 1kHz...1GHz
HMS3000, HMS3010	0Hz (zero span) and 100Hz...3GHz
Spectral purity, SSB phase noise:	
30kHz from carrier (500MHz, +20°C...30°C)	‹-85dBc/Hz
100kHz from carrier (500MHz, +20°C...30°C)	‹-100dBc/Hz
1MHz from carrier (500MHz, +20°C...30°C)	‹-120dBc/Hz
Sweep time:	
Span = 0Hz	20ms...100s
Span › 0Hz	20ms...1000s, min. 20ms/600MHz
Resolution bandwidths (-3 dB)**:**	
HMS1000, HMS1010	1kHz...1MHz in 1–3 steps, 200kHz
HMS3000, HMS3010	100Hz...1MHz in 1–3 steps, 200kHz
Tolerance:	
≤ 300kHz	± 5% typ.
1MHz	± 10% typ.
Resolution bandwidths (-6 dB)**:**	
HMS1000, HMS1010	9kHz, 120kHz,1MHz
HMS3000, HMS3010	200Hz, 9kHz, 120kHz, 1MHz
Video bandwidths:	10Hz...1MHz in 1–3 steps

Amplitude

Display range:	Average noise trace up to +20dBm
Amplitude measurement range:	Typ. -114dBm...+20dBm
Max. permissible DC at HF input:	80V
Max. power at HF input:	20dBm, 30dBm für max. 3 Min.
Intermodulation free range:	
IM3 products, 2 x –20dBm (-10dBm ref. level)	66dB typ. (typ. +13dBm third-order intercept)
(at distance between signals ≤ 2MHz)	60dB typ. (+10dBm TOI)
(at distance between signals › 2MHz)	66dB typ. (typ. +13dBm TOI)
DANL (Displayed average noise level):	
(RBW 1kHz, VBW 10Hz, ref. level ≤ –30dBm 10MHz...1GHz resp. 3GHz)	-105dBm, typ. -114dBm
With Preamp.	-135dBm typ. (100Hz RBW)
Inherent spurious:	
(ref. level ≤ -20dBm, f ‹ 30MHz, RBW ≤ 100kHz)	‹ -80dBm
Input related spurious:	
(Mixer level ≤ -40dBm, carrier offset › 1MHz)	-70dBc typ., -55dBc (2...3GHz)
2nd harmonic receive frequency	
(mixer level -40dBm):	-60dBc typ.
Level display:	
Reference level	-80dBm...+20dBm in 1dB steps
Display range	80dB, 40dB, 20dB, 10dB, linear
Logarithmic display scaling	dBm, dBµV, dBmV
Linear display scaling	µV, mV, V, nW, µW, mW, W
Measured curves:	1 curve and 1 memory curve
Trace Mathematics:	A-B (curve-stored curve), B-A
Detectors:	Auto-, Min-, Max-Peak, Sample, RMS, Average, Quasi-Peak
Failure of level display:	‹ 1,5dB, typ. 0,5dB (ref. level to ref. level-50dB, 20°C...30°C)

Marker / Deltamarker

Number of marker:	8
Marker functions:	Peak, next peak, minimum, center = marker frequency, reference level = marker level, all marker on peak
Marker displays:	Normal (level), noise marker, (frequency) counter

Inputs / Outputs

HF Input	N socket
Input Impedance:	50Ω
VSWR (10MHz...1GHz/3GHz)**:**	‹ 1,5 typ.
Output tracking generator:	
(HMS1010/HMS3010)	N socket
Output Impedance:	50Ω
Frequency range:	5MHz...1GHz/3GHz
Output level:	-20dBm...0dBm in 1dB steps
Trigger and external reference input:	BNC socket, switchable
Trigger voltage	TTL
Reference frequency	10MHz
Essential level (50Ω)	10dBm
Supply output for field probes:	6VDC, max. 100mA (2,5mm DIN jack)
Audio output (Phone):	3,5mm DIN jack
Demodulation	AM and FM

Miscellaneous

Display:	6,5" TFT Color VGA Display
Save / Recall memory:	10 complete device settings
Trigger:	Free run, Video Trigger, external Trigger
Interfaces:	Dual-Interface USB/RS-232 (HO720), USB-Stick (frontside), USB-Printer (rear side) from SW 2.0, DVI for ext. monitor
Power supply:	105/253 V, 50/60 Hz, CAT II
Power consumption:	Max. 40Watt at 230V, 50 Hz
Protection class:	Safety class I (EN61010-1)
Operating temperature:	+5°C...+40°C
Storage temperature:	-20°C...+70°C
Max. rel. humidity:	5%...80% (non condensing)
Dimensions (W x H x D)**:**	285 x 175 x 220 mm
Weight:	3.6 kg

Accessories supplied:
Line cord, Operating manual, Dual-Interface USB/RS-232 (HO720), CD, HZ21 Adapter plug (N plug to BNC socket)

Optional accessories:

HO3011	Preamplifier -135dBm DANL (100Hz RBW)
HO730	Dual-Interface Ethernet/USB
HO740	Interface IEEE-488 (GPIB), galvanically isolated
HZ547	3GHz VSWR Test Unit for HMS1010, HMS3010
HZ520	Plug-in Antenna with BNC connection
HZ530	Near-Field Probe Set 1GHz for EMV diagnostics
HZ540	Near-Field Probe Set 3GHz for EMV diagnostics
HZ560	Transient limiter
HZ575	75/50Ω Converter
HZ46	4RU 19'' Rackmount Kit

www.hameg.com

HAMEG Instruments GmbH · Industriestr. 6 · D-63533 Mainhausen · Tel +49 (0) 6182 800 0 · Fax +49 (0) 6182 800 100 · www.hameg.com · info@hameg.com